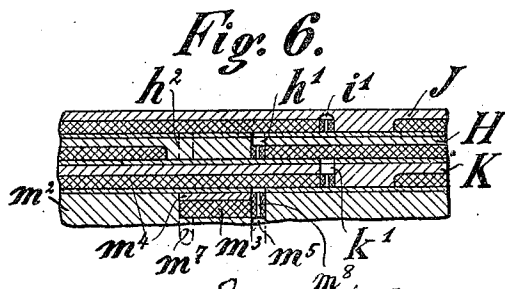
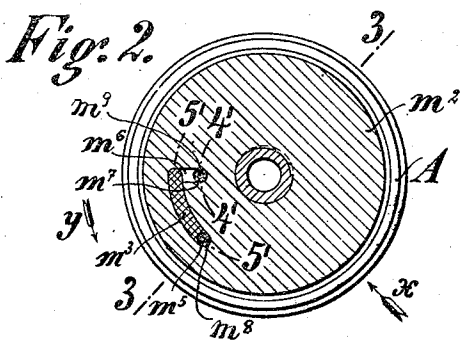
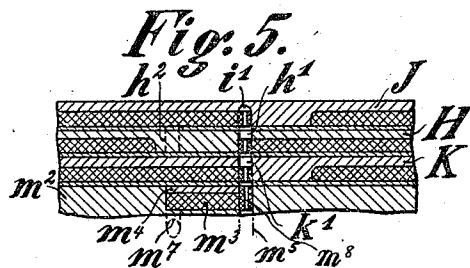
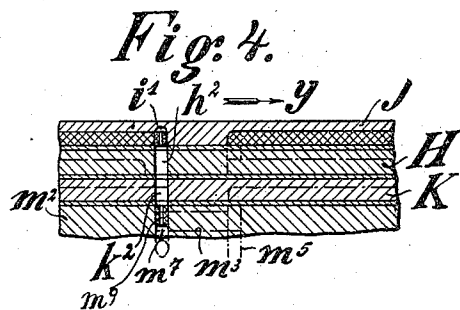
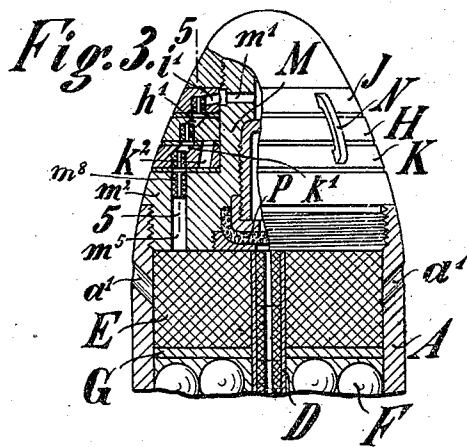
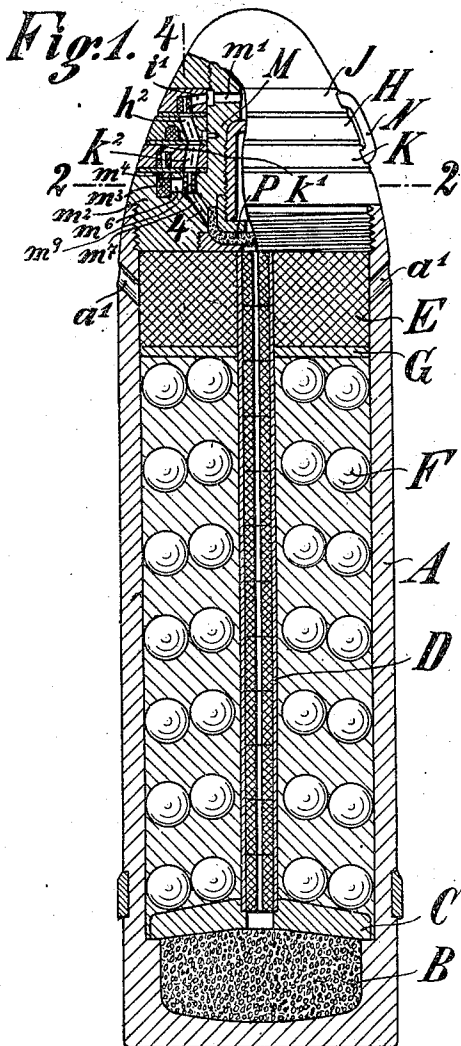


1,098,202.

Patented May 26, 1914.



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UNITED STATES PATENT OFFICE.

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PROJECTILE.

1,098,202.

Specification of Letters Patent.

Patented May 26, 1914.

Application filed October 19, 1911. Serial No. 655,572.

To all whom it may concern:

Be it known that I, KARL WIESER, a subject of the Emperor of Germany, and a resident of Bredeney, Germany, have invented certain new and useful Improvements in Projectiles, of which the following is a specification.

This invention relates to projectiles designed especially for firing at air ships, which projectiles have a charge rendering visible the trajectory and a bursting charge. In known projectiles of this kind, a time fuse, after a period of time corresponding to its adjustment, ignites the charge which makes the trajectory visible and, in a specified time after ignition of this charge, causes the ignition of the bursting charge. In this kind of projectiles, the bursting charge, however, can be ignited only after the combustion of the charge which renders the trajectory visible, and the space of time after which the ignition of the bursting charge is produced, is determined by the space of time required for the combustion of the charge which makes the trajectory visible. Should, therefore, the space of time intervening between the ignition of the two charges have, in some measure a constant value, it is necessary to select for the charge rendering the trajectory visible, a substance which burns with the utmost uniformity. The known substances of this kind, for rendering the trajectory visible, are, however, somewhat peculiar in that, in burning, they only produce a poorly visible smoke. Moreover, a charge produced from such material can only have a comparatively small section if it is to approximate uniform burning, so that the amount of smoke produced is also very slight.

This invention has for its purpose to provide a projectile which is free from the stated objections.

In the accompanying drawing, is represented, as an embodiment of the subject matter of the invention, a projectile which contains a charge for rendering the trajectory visible and is constructed as a base chamber shrapnel.

In said drawing, Figure 1 is an axial longitudinal section of the projectile; Fig. 2 is a section on the line 2—2, Fig. 1, seen from above; Fig. 3 is an axial longitudinal section of the upper portion of the projectile on the line 3—3, Fig. 2, seen in the direction

of the arrow a , with another adjustment of the fuse; Fig. 4 shows in schematic representation, a section on the line 4—4, Fig. 1, and the line 4¹—4¹ of Fig. 2, seen from the left; and Figs. 5 and 6, likewise in schematic representation, show a section on the line 5—5, Fig. 3, and 5¹—5¹ of Fig. 2, seen from the left, with a different adjustment of the fuse.

A designates the shell of the projectile, B the shrapnel bursting charge arranged in a base chamber, C the driving disk and D the igniting tube, which leads from a burning time fuse of the projectile to the shrapnel charge B. In the forward portion of the projectile shell A is arranged the smoke charge E, which is separated from the shrapnel filling F, by a disk G. In the portions of the projectile shell A surrounding the smoke charge E, are provided slanting apertures a^1 , through which the smoke can escape.

The burning fuse has three superposed priming circles K, H, J, of which, as usual, the middle one, H, is fixedly connected with the fuse body M, while the upper priming circle J and the lower one K are rotatably arranged and coupled together by a bridge N. The arrangement of the igniting pellet which produces the fire jet at the time of firing, (not shown) and the fire duct m^1 leading therefrom to the upper priming circle J, are carried out in a known manner. Pressed into the fuse plate m^2 and covered by a plate m^4 , is a burning composition m^3 , whose length corresponds to a specified time, for example, two seconds. At its one end, the composition m^3 terminates immediately at a channel m^5 which leads from the front surface of the fuse plate, to the smoke charge E. The end of the channel m^5 opening into the front face of the fuse plate receives a slightly compressed fulminant m^8 , see Figs. 2, 3, 5 and 6, which is intended for lengthening and transmitting the flame. The channel m^5 lies in one and the same axial plane with the fire hole h^1 leading to the edge of the composition of the fixed priming circle H, so that when the fire holes i^1 and h^1 leading to the edges of the composition of the rotatable priming circles J and K are also adjusted to the same axial plane, the fire jet can reach immediately to the smoke charge E. From the other end of the composition m^3 , a channel m^6 extends radi-

ally inward in the fuse plate. This terminates in a channel m^7 , which leads from the front surface of the fuse plate to the striking charge P, which stands in communication through the fire tube D, with the shrapnel charge B. The end of the channel m^7 opening into the front face of the fuse plate is provided with a slightly compressed fulminate m^9 , see Figs. 1, 2 and 4 for the same purpose as described above for channel m^5 . In the same axial plane with the channel m^7 , in the fixed composition piece H, but lying wholly separated from its burning substance, is provided a channel h^2 . Furthermore, there is arranged in the under priming circle K, but lying fully separated from its burning composition, a channel k^2 , which lies in the same axial plane as the fire holes h^1 and i^1 . The arrangement is thus so determined (compare Figs. 1 and 4) that when adjusted to the same axial plane as the channel h^2 , there will be produced in common with it, by the fire hole i^1 and the channel k^2 , a direct connection between the channel m^7 , leading to the striking charge P and the chamber in which the fire jet is produced.

When the fuse is adjusted in the above described manner, the flame generated in firing the projectile takes a course directed to the shrapnel charge B through the parts m^1 , i^1 , h^2 , k^2 , m^9 , m^7 , P and D, compare Figs. 1 and 4, and explodes said charge, so that the projectile will have a shrapnel action resembling that of the case-shot action. The composition m^8 and smoke charge E remain then without influence on the action of the projectile.

If thereupon the revoluble priming surfaces J and K are turned away from the position shown in Figs. 1 and 4 and in direction of the arrow y , see Figs. 2 and 4, into the position represented in Figs. 3 and 5, the flame generated in the firing of the projectile will take the direction m^1 , i^1 , h^1 , k^1 , m^8 , m^5 directly into the smoke charge E and smoke production will therefore be the immediate consequence. Simultaneously the composition m^8 will be ignited, see Fig. 2 and after burning the same (that is, in accordance with the supposed example, after two seconds) the flame will arrive at the shrapnel charge B and bring that into explosion after having traveled through m^6 , m^9 , m^7 , P and D. By continued turning of the priming circles J and K in the direction of an arrow y the path of the flame will evidently be lengthened, see Fig. 6, between i^1 and h^1 and between h^1 and k^1 as well as between k^1 and m^5 or m^8 partly from the slow burning fulminate situated in the priming circles J, H, K. The flame therefore requires a long time to pass through i^1 , h^1 , k^1 , m^8 , m^5 to the smoke charge E. The interval from the moment of firing to the ignition of the smoke charge will con-

sequently be lengthened. On the other hand the interval from the ignition of the smoke charge E to the explosion of the shrapnel charge will remain the same, as the composition m^8 , having a constant duration of burning, must first have been consumed after having ignited the smoke charge, before the flame can reach the shrapnel charge. In all cases with the exception of those represented in Figs. 1 and 4, the composition m^8 will therefore come into action.

Inasmuch as in the described projectile, the smoke charge lies completely outside of the path by which the fire jet reaches the shrapnel charge B, we are free to select for the smoke charge, without respect to uniform burning, a substance which proves most desirable with respect to the production of a readily visible smoke; also free to make the smoke charge so large that a sufficient quantity of smoke will be produced.

The described projectile is particularly adapted for firing at air ships, since the smoke line which it produces essentially facilitates the determination of the position of the point of bursting relative to the target. From the location of the target to the smoke line, can also readily be estimated, since the length of the smoke line always corresponds to a specified known burning time, how much must be added to or deducted from the burning duration in order that the bursting point will be given its most favorable position.

I claim:—

1. In a projectile having a charge rendering visible the trajectory and a bursting charge; an adjustable time fuse adapted, after expiration of time for which it is adjusted, to ignite said smoke charge and having a path of communication through which, at a specified time thereafter, it is adapted to effect ignition of the bursting charge; the said smoke charge lying entirely outside of the path of communication through which the fire jet reaches the bursting charge.

2. In a projectile having a charge rendering visible the trajectory and a bursting charge; an adjustable time fuse, having igniting communication with the smoke charge and having igniting communication with the bursting charge wholly independent of the smoke charge; said igniting communication with the bursting charge embodying a burning substance that causes ignition effected therethrough, to occur only at a definite time after ignition of the smoke charge.

3. In a projectile having a charge rendering visible the trajectory and a bursting charge; a time fuse, a fire duct leading from the time fuse to the smoke charge, a channel independent of said duct and communicating with the bursting charge, and a burning substance having a predetermined burning du-

ration, and communicating at one end with the fire duct leading to the smoke charge and at the other end communicating with the channel leading to the bursting charge.

- 5 4. In a projectile having a charge rendering visible the trajectory and a bursting charge; a time fuse, a fire duct leading from the time fuse to the smoke charge, a channel independent of said duct and communicating with the bursting charge, and a fuse plate having embedded therein and suitably covered, a burning substance having a predetermined burning duration, and communicating at one end with the fire duct
10 leading to the smoke charge and at the other end communicating with the channel leading to the bursting charge.

- 5 5. In a shrapnel projectile having a charge rendering visible the trajectory and a bursting charge; a time fuse having in its fire path a burning substance of predetermined burning duration, and also a channel leading therefrom to the bursting charge; said fuse also having a fire passage leading
20 instantly to the bursting charge independently of the substance of predetermined burning duration; and said fuse being adjustable to direct the igniting jet through either path at will.

- 30 6. In a projectile having a charge rendering visible the trajectory and a shrapnel

bursting charge, a time fuse, a ring having a burning substance adapted to communicate fire to the bursting charge and also a fire duct leading to the bursting charge independently of said burning charge; said ring being adjustable to introduce into the fire path, either said burning substance or said fire duct at will.

7. A burning fuse for projectiles having
40 a charge rendering visible the trajectory and a shrapnel bursting charge, said fuse comprising a fuse body and three superimposed priming circles of which the intermediate circle is fixed relatively to the fuse body and
45 the other two are rotarily adjustable relatively thereto; said circles being provided with burning substances for controlling the time of transmission of the igniting jet and also provided with fire passages independent of said burning substances adapted to register with one another and also directly with the igniting chamber of the fuse and directly with the bursting charge.

The foregoing specification signed at Bar-
55 men, Germany, this 6th day of October, 1911.

KARL WIESER. [L. s.]

In presence of—
L. NUFER,
A. NUFER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."